CLAIMS

I claim:

1. A microcomputer system for contemporaneous real-time entry and compilation of a source program, and comprising

console means for input of successive characters constituting said source program,

semiconductor memory means for storing said source program and an object program resulting from the translation of the source program, and also storing a compiler and an interrupt service routine,

a central processing unit having an interrupt input, a program counter, and means responsive to activation of said interrupt input to load into said program counter a vector address leading to said interrupt service routine,

means to initialize the compiler,

said compiler normally having control of the central processing unit for compiling the partial source program as the latter is entered into said memory means,

said compiler including means for translating said partial source program into object code and for entering the latter into said memory means,

means responsive to operation of said console means to activate said interrupt input and thereby pass control of the central processing unit from said compiler to said interrupt

service routine,

said interrupt service routine including editor means for successively entering said input characters into selected locations of said memory means and for executing editing commands,

said editor means including means for designating a location in the stored source program at which location the compiler is to pause while awaiting the input of a further portion of the source program,

said compiler including a loop for execution when the compiler reaches said designated pause location and repeatedly executed until said location is changed,

said editor means advancing said pause location as additional portions of the source program are input,

said interrupt service routine including means to return control of the central processing unit to the compiler upon completion of either the storage of at least one input character or the execution of an editing command.

2. A computer system as recited in Claim 1 wherein

said editor means includes means for modifying a source program portion which has previously been compiled by the compiler, and

means to reinitialize the compiler to cause the latter to recompile at least a part of the source program after said compiled portion has been modified.

3. A computer system as recited in Claim 1 wherein

said console means includes a display screen and a keyboard having keys,

said editor means including means to display on said screen a portion of the source code stored in said memory means,

a cursor to designate on the screen the location of the source program to be affected by an operation of the editor,

means to move said cursor on the screen in response to the striking of predetermined keys of said keyboard,

means to move said pause location to a point preceding the program location designated by the cursor after the cursor has been moved in an upward direction corresponding to a direction toward the beginning of the source program,

means to initialize the compiler before the start of the compilation, and

means to reinitialize the compiler after the cursor has been moved in said upward direction, thereby causing the compiler to recompile at least a portion of the source code.

4. A computer system for contemporaneous real-time entry and compilation of a program having source code, and comprising

a console having a keyboard for input of successive characters constituting the source code of said program,

a memory for storing said source code, and also storing a compiler and an editor,

said editor including means for successively entering said input characters into said memory to store therein a portion of the source program and also including means for executing editing commands,

a central processing unit,

means to initialize the compiler,

said compiler normally having control of the central processing unit for parsing the source program portion stored in said memory means,

means to pass control of the central processing unit from said compiler to said editor,

means for designating a location in the source program at which point the compiler is to pause while awaiting the input of a further portion of the source program,

said compiler including means for pausing when the compiler reaches said designated pause location,

means advancing said pause location as additional portions of the source program are input, and

means to return control of the central processing unit to the compiler upon completion of either the entry of at least one input character or the execution of an editing command.

5. A computer system for contemporaneous real-time entry and compilation of source code, and comprising

buffer means for storing code,

keyboard means having keys,

input means for entering source code into said system and for editing source code previously entered therein,

a compiler for performing at least lexical and syntactic analyses of the source code as the latter is entered into said system and normally having control of the system,

means actuable to call said input means and pass control of the system to the input means in response to operation of said keyboard means,

limiting means for preventing the compiler from attempting to analyse code beyond a pause location in the buffer determined by said input means, and

means to return control of the system to the compiler upon completion of each entering and editing operation.

6. A computer system as recited in Claim 5 wherein

said limiting means includes means for identifying said pause location of said source code at which location the compiler is to pause until said identification is changed by the input means, and

means for advancing said pause location after a predetermined quantity of new source code has been entered into the system so as to permit the compiler to analyze said new source code.

7. A computer system as set forth in Claim 5 and comprising

means to initialize the compiler before start of the compilation,

means for modifying a previously compiled portion of the source code, and

means to reinitialize said compiler for recompilation of at least said modified previously compiled portion of the source code.

8. A computer system for contemporaneous real-time entry and compilation of source code, and comprising

compiler means normally having control of the system for compiling said source code except while interrupted,

interrupt means actuable to take control of said computer system from said compiler means to enter a source code byte into said system, and

return means to return control of said computer system from said interrupt means to said compiler means after said interrupt

means has completed entry of said source code byte.

9. A computer system as recited in Claim 8 and comprising

means for identifying a pause point of said source code at which location the compiler is to pause until said identification is changed, and

means for advancing said pause point after a predetermined quantity of new source code has been entered so as to permit the compiler to process said new source code.

10. A computer system as recited in Claim 8 and comprising

means to initialize the compiler means,

editor means to modify the source code, and

means to reinitialize the compiler means after modification of the source code to cause the compiler means to recompile the modified source code.

11. A computer system as recited in Claim 10 and comprising

a terminal having keys, and

means actuating said interrupt means in response to striking at least one of said keys.

12. A computer system as recited in Claim 11 wherein

said editor means includes means for controlling the extent of the source code processed by said compiler means.

13. A computer system as recited in Claim 12 wherein

said editor means includes means for controlling reinitialization of the compiler means to cause the latter to recompile the source code.

14. A compiler system for real-time compilation of source code as the latter is entered at a console keyboard, said system comprising

a central processing unit,

a console having a keyboard for entry of source code into said system,

interrupt means responsive to actuation of a key at said keyboard for entering a source code byte into said system,

compiler means for parsing said source code and normally controlling said central processing unit,

means for passing control of the central processing unit to said interrupt means after each actuation of a key at said keyboard, and

means for passing control of the central processing unit back to the compiler means after each entry of a source code byte into the system.

15. A compiler system as recited in Claim 14 wherein

said editor means includes means for controlling the extent of the source code to be parsed by the compiler means.

16. A compiler system as recited in Claim 15 and comprising

means responsive to modification of the source code by the editor means, for causing the compiler means to recompile at least a portion of the source code.

17. A compiler system as recited in Claim 16 wherein

said controlling means comprises means for identifying a pause location in said source code at which location the compiler is to pause until said identification is changed by said editor means, and

means for advancing said pause location after new source code has been entered so as to permit the compiler means to parse said new source code.

18. A compiler system for real-time compilation of source code as the latter is entered at a console keyboard, said system comprising

a processing unit,

a console having a keyboard for entry of source code into said system,

interrupt means for entering source code into the system,

editor means for modifying the entered source code,

said editor means performing an individual editing operation in response to the actuation of a sequence of one or more keys at said keyboard,

compiler means for compiling said source code and normally controlling said processing unit,

means for passing control of the processing unit from said compiler means to said editor means after each actuation of said key sequence at said keyboard, and

means for passing control of the processing unit back to said compiler means after each said individual editing operation by said editor means.

19. A compiler system as recited in Claim 18 wherein said editor means includes means for controlling the extent of the source code to be compiled by the compiler means.

20. A compiler system as recited in Claim 18 wherein said compiler means comprises means to recompile at least a portion of the source code after the latter is modified by the editor means.

21. A compiler system as recited in Claim 19 wherein said controlling means comprises means for identifying a pause location in said source code at which location the compiler is to pause until said identification is changed by said editor means, and

means for advancing said pause location after new source code has been entered so as to permit the compiler means to compile said new source code.

22. A computer system for real-time compilation of source code concurrently as the source code is being entered into the system, and comprising

a keyboard having a plurality of keys,

source code entering means responsive to a sequence of keystrokes at said keyboard to enter into the system character codes constituting the source code to be compiled,

said sequence having a time interval between each pair of successive keystrokes, and

compiler means operable during each of said time intervals between keystrokes for compiling the entered source code.

23. A computer system as recited Claim 22 and comprising

a central processing unit,

said compiler means normally having control of said central processing unit,

means for passing control of the central processing unit to said source code entering means after each said striking of any of said keys, and

means for returning control of the central processing unit back to said compiler means after entry into the system of a character code corresponding to the struck key.

24. A computer system as recited in Claim 23 wherein

said source code entering means comprises editor means for modifying the entered source code, and

said compiler means including means for recompiling at least a portion of the compiled source code in response to modification of the latter by said editor means.

25. A computer system as recited in Claim 24 and comprising

buffer means including at least one memory buffer for storing character codes,

said source code entering means including interrupt-driven means operable in response to striking any of said keys for interrupting said compiler means and storing in said memory buffer a character code corresponding to the struck key, and

said source code entering means including means for returning control to said compiler means after storing said character code.

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